Practices and experiences of distant education during the COVID-19 pandemic: The perspectives of six- to sixteen-year-olds from three high-income countries

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ABSTRACT

The paper explores children's perspectives of distance education, their learning experiences and school satisfaction in Luxembourg, Germany and Switzerland during the first wave of the COVID-19 pandemic. The data stem from an online questionnaire completed by 1773 primary and secondary school children aged 6–16. While the paper uses quantitative and qualitative data, it aligns with the qualitative research tradition and predominantly uses an inductive approach. The findings show that teachers offered varied types of distance education and that parents supported children. The children's contact time with teachers and their time spent on schoolwork varied within and between countries. Their school satisfaction dropped in the three countries. The paper calls for training and development on distant education.

1. Introduction

Since Spring 2019, governments across the globe have been taking measures to contain the spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that causes the COVID-19 disease. National and regional lockdowns and school closures are some of the actions taken to increase social distancing and reduce the transmission of the virus. In April 2020, UNESCO (2020a) reported that about 1.5 billion (84.8 %) children and young people did not attend schools in 172 countries. UNESCO warned policy-makers to carefully weigh the impact of school closures against economic, societal and educational consequences. Closing schools does not only lead to interrupted learning but possibly also to social isolation, compromised nutrition, and the unavailability or curtailment of childcare services affecting children's psychological and emotional well-being (Engel de Abreu et al., 2021; Viner et al., 2020).

At the beginning of the COVID-19 pandemic it was assumed that school closures may help flatten the peak of the pandemic. While the effectiveness of this measure is still unclear, there is evidence of school closures affecting children's health and well-being (Viner et al., 2021). A recent review of 72 studies on the impact of school closures (for multiple reasons including the COVID-19 pandemic), identified effects on children's well-being as well as emotional (e.g. stress, anxiety), behavioral and restlessness issues. Some adolescents are at risk of depressive symptoms (Viner et al., 2021). Loneliness resulting from school closures

and quarantine measures can lead to depression and longer-term mental health issues (Loades et al., 2020). School closures have also been associated with risky behaviors in adulthood including drug use, juvenile delinquency and even alcoholism and unemployment (Bonal & González, 2020). The severity of these consequences depends, among other matters, on the children's socio-economic status, age, previous academic achievements and family characteristics.

Further evidence of the effects of the coronavirus pandemic on children's well-being and learning comes from some qualitative studies. The World Vision study carried out with children in 13 countries, reported that 71% of children felt isolated and lonely (Cuevas-Parra & Stephano, 2020). According to the children, school disruption, emotional distress, and increased poverty had dramatically changed their lives and had a negative impact on their learning. Interviews with parents in Pakistan (Bhamani et al., 2020) and Italy (Mangiavacchi et al., 2020) indicate that they were concerned about their children's social and emotional development. While parents surveyed in Wales reported an increase in children's emotional, behavioral and attentional difficulties, the teachers described some children as isolated and withdrawn (Marchant et al., 2020). Similarly, a cross cultural study that explored subjective well-being during the COVID-19 pandemic in 10 to 16-year-olds in Luxembourg, Germany and Brazil, showed a decrease in levels of subjective well-being during the first wave of the pandemic (Engel de Abreu et al., 2021). Notably, the study identified several common factors that predicted children's subjective well-being across the three

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countries, including the difficulty, volume and content of their school-work during distant education.

The present paper follows on from Engel de Abreu et al. (2021) and uses, in part, the same dataset. However, the focus lies on the home-schooling experiences of 6 to 16-year-olds from Luxembourg, Germany and Switzerland. The aim of this paper is to explore children's perspectives of distance education, their learning experiences and school satisfaction during the pandemic in spring 2020. To this end, 22 questions from an online questionnaire (Kirsch et al., 2020a) completed by 1773 primary and secondary school children were analyzed using descriptive statistics and content analysis. The findings show that children appear to have had similar experiences across these high-income countries that are geographically close and share cultural similarities. The paper concludes with some hypotheses and offers implications for teachers and policy-makers.

2. Literature review

To guarantee the children's right to education during the COVID-19 pandemic in 2020, teachers offered distance education when schools closed. Effective distance education requires the availability of electronic devices and a good internet connection. UNESCO (2020b) warned about the risk of deepening existing learning inequalities as a result of not all learners having access to these tools or being digitally competent. Furthermore, distant education can only be effective if teachers have the necessary digital skills and ability to set appropriate tasks, scaffold learning and provide feedback (Bonal & González, 2020). In addition, children need parental support. This section begins with a review of the challenges of distant education. It then examines teaching practices during the COVID-19 pandemic in a range of countries as well as the support given by parents. It closes with children's learning experiences, learning time and achievements.

2.1. Distance education

Mobile technologies have the potential to motivate learners, increase their engagement, widen opportunities for meaningful interactions, and connect formal and informal learning environments (Karsenti & Fievez, 2013; Kukulska-Hulme, 2013; Martin-Beltrán et al., 2017). However, studies have also indicated that teachers are unsure of how to use these tools effectively to promote dialogue (Mercer et al., 2019) and support learning (Karsenti & Fievez, 2013; Kirsch & Bes, 2017). Teachers appear to use new technologies based on teacher-led pedagogies. For example, Zimmer et al. (2021) hold that some teachers would ask students to use digital tools in conventional tasks such as creating a poster. Similarly, Biesta (2019) found that many popular technology-based approaches such as MOOCs or instructional videos are based on traditional teaching methods where one person talks to learners who are listening and watching. For learning to take place in online environments, it is important that students engage, interact and have a good relationship with the teacher (Bergdahl et al., 2020; Kaur & Singh Bhatt, 2020). These studies, which were carried out before the pandemic, highlight the difficulties of using mobile technologies successfully. Across the globe many teachers admitted lacking the technological and pedagogical skills needed to provide efficient distance education during the COVID-19 pandemic (Ahmady et al., 2020; Bergdahl & Nouri, 2020; Huber et al., 2020; Hyseni et al., 2020; Naji, 2020; Shin Wan, 2020).

2.2. Distance education during school closures

It appears that in many countries, teachers offered a combination of synchronous and asynchronous education during lockdowns. In Germany, Switzerland, Austria, Sweden, Italy and Luxembourg, teachers made use of emails, online platforms and live-lessons (Huber et al., 2020; Bergdahl & Nouri, 2020; Mangiavacchi et al., 2020; MENJE, 2020). In Germany, the Czech Republic, England and Sweden,

teachers were reported assigning tasks, at times differentiated to provide for individual needs, and sending these by postal mail or email or posted these on online platforms. More rarely, they gave feedback or organized online assessment (Bayrakdar & Guveli, 2020; Bergdahl & Nouri, 2020; Brom et al., 2020; Green, 2020; König et al., 2020; PAQ, 2020; Penington, 2020). Some of the parents surveyed in the Czech Republic found that teachers rarely explained tasks or communicated with students in chats or over the phone (PAQ, 2020). Like teachers in Iran (Ahmady et al., 2020), Kosovo (Hyseni et al., 2020), China (Kaur & Singh Bhatt, 2020) or Malaysia (Shin Wan, 2020), they made use of various TV programs or asked students to watch online videos to get input (Green, 2020). Synchronous teaching in the form of live-lessons was rare. In England, 59 % of secondary students had some form of online learning through video conferences or chats (Andrew et al., 2020; Penington, 2020). By contrast, a different study in England shows that 71 % of children in state schools received no or less than one daily online lesson (Green, 2020). In Germany, 20 % of early career teachers provided online lessons at least once a week but 70 % did not provide any (König et al., 2020). In a different study, 10 % of the children in Germany, Switzerland and Austria, reported having never had online teaching (Huber et al., 2020). Interviews with children in Luxembourg revealed a range of practices: some had online lessons every day, others one lesson a week (Kirsch et al., 2020b). Online distance education was more limited and heterogeneous in primary schools (Mangiavacchi et al., 2020; Penington, 2020). A minority of children were not offered any type of distance education. This was the case for 9 % of children in England (Bayrakdar & Guveli, 2020). While distance education increases children's educational opportunities and learning time, it has been unequal. The provision for children of less affluent families and with an ethnic minority background has been more limited than that of their peers (Andrew et al., 2020; Bayrakdar & Guveli, 2020; Green, 2020; Kirsch et al., 2020b).

2.3. The home learning environment

It has been shown that distance education was a challenge for many parents who were overwhelmed by the support their children needed (Huber et al., 2020; Hyseni et al., 2020; MENJE, 2020). It became a burden for families who were less affluent, did not speak the languages of the educational system, and had children with educational needs (Colao et al., 2020).

A requirement to take part in online distance education during the COVID-19 pandemic was the availability of computers, tablets or phones, and internet. The lack of these electronic resources was one of the reasons why some children could not be reached during school closures (Children's Commissioner for Wales, 2020; Huber et al., 2020; Petretto et al., 2020) and why the attainment gap between students from different socioeconomic backgrounds has widened (Bonal & González, 2020). In the UK, 37% of children in primary and 61% in secondary schools owned a computer or a tablet and 59% versus 36% shared one with family members (Penington, 2020). Children in the high-income countries Germany, Switzerland, Austria and Luxembourg seem to have more access to resources: only about 10 % do not have the necessary equipment (Huber et al., 2020; MENJE, 2020).

Apart from providing material resources, parents assisted children while learning. Children from more affluent and educated families are likely to have more educational resources and more opportunities for private tuition, and be better supported by more knowledgeable parents compared to children from more disadvantaged backgrounds (Bonal & González, 2020). For example, some parents in the UK used online tutorials, online tutoring or had subscribed to apps and websites (Green, 2020). By contrast, families from less affluent backgrounds may lack the content knowledge, teaching skills and resources to assist their children as was the case with some lower-educated families in the Netherlands (Bol, 2020). Some studies provide insights into the time parents spent on assisting children. On av-

Table 1
Children's learning time in hours as indicated in other studies.

Author	Country	Age group	Average in hours	<1 h	2–4 h	>4 h
Bonal and González (2020)	Spain	10–18	N.A.	28%	N.A.	8%
Penington (2020)	UK	5–12	1–2	11%	46%	15%
		13–18	2–3	9%	43%	27%
MENJE (2020)	Luxembourg	6–18	3.6	N.A.	N.A.	N.A.
Brom et al. (2020)	Czech Republic	6–15	N.A.	N.A.	72%	N.A.
Huber et al. (2020)	Germany, Switzerland, Austria	6–20	3.5	11%	29%	53%

Note. N.A.: Data not available.

erage, parents mentioned 1.2 h daily in the Czech Republic, 2.4 h in the UK and 2.3 h in Luxembourg (Brom et al., 2020; Green, 2020; MENJE, 2020). The support depended on the parents' availability, content knowledge and language background (Bol, 2020; Brom et al., 2020; Marchant et al., 2020; MENJE, 2020) as well as the children's age and needs. The younger the children, the more assistance they needed (Penington, 2020; Petretto et al., 2020).

2.4. Learning during the pandemic

The students' learning experiences seem to vary considerably across and within countries. Teachers surveyed in Sweden described students generally as engaged, motivated and patient although some showed distress from isolation or displayed difficulties with motivation and discipline. Many had good digital literacy skills although others needed technical support. Some students worked better from home because they could concentrate better, others needed support to understand the written instructions (Bergdahl & Nouri, 2020). Similarly, many children in Wales would have liked more support and additional online provision. While some commented that it was difficult to teach themselves, others reported working well from home as they had more time and felt less under pressure. They enjoyed self-directed learning and had developed new skills (Children's Commissioner for Wales, 2020). The variety of experiences was as pronounced in Germany, Switzerland and Austria where Huber et al. (2020) identified two groups of participants. Children in the first one got up early, were able to structure their day, were supported at home and spoke positively about the opportunities for independent learning, autonomy and creativity. Children in the second group found it more difficult to get out of bed, were more passive and had less support. They perceived distance education as a burden and asked for more support and greater availability of the teachers. A different study in Germany found that many children were overwhelmed with the home-schooling and did not know how to organize their studies. Their school satisfaction rates dropped (Andresen et al., 2020).

Many studies investigated the number of hours children spent learning (which often means time spent on schoolwork), because this time tends to correlate with academic achievement (Andrew et al., 2020; Bonal & González, 2020). Household income (Andrew et al., 2020; Bayrakdar & Guveli, 2020; Bonal & González, 2020), language background and education level of the parents (Bayrakdar & Guveli, 2020; Bonal & González, 2020), ethnicity (Bayrakdar & Guveli, 2020) and the children's education pathway (Bayrakdar & Guveli, 2020; Bonal & González, 2020; Brom et al., 2020) have been identified as factors that influence learning time. Generally speaking, there is a clear tendency for children in secondary school to spent more hours on school-related activities than children in primary schools. Table 1 provides a summary of the learning time identified in several studies from different countries. A cross-country comparison may, however, not be fair as the education systems, the methodologies and the children's ages differ. It is therefore more interesting to examine the differences of learning time between children within each country.

There is some evidence that distance education has impacted children's learning progress and achievements. In Germany, Switzerland and Austria, 76 % of the surveyed students reported that they

learned less during the pandemic than during their normal school time (Huber et al., 2020). Children in the World Vision study similarly agreed that distance learning had a negative impact on their learning (Cuevas-Parra & Stephano, 2020). Several studies in the UK provide evidence of learning loss. Andrew et al. (2020), Bayrakdar and Guveli (2020) and Marchant et al. (2020) confirm that some children, particularly disadvantaged ones, have fallen behind. These more vulnerable children tend to come from families with lower socio-economic status and ethnic minority background, or do not speak the national language(s). Sharp et al. (2020) estimated that the learning gap between disadvantaged students and peers has increased by 46% owing to the pandemic.

This literature review has drawn attention to the many technological and educational challenges that teachers, parents and children faced on account of school closures due to COVID-19. Most studies were based on surveys with teachers and parents and only very few asked children directly how they felt during the pandemic (Cuevas-Parra & Stephano, 2020; Huber et al., 2020; UNICEF Australia, 2020). The present study fills this gap by giving children a voice (Petretto et al., 2020). It explores the home-schooling experiences of primary and secondary school children in three European high-income countries by asking children directly in a questionnaire. More specifically, the study addressed the following research questions:

- What practices of distant education have been put in place in primary and secondary schools in Luxembourg, Germany and Switzerland?
- What are children's experiences of distant learning?
- Did children's school satisfaction change from before to during the pandemic?

Although this paper uses quantitative and qualitative data, it aligns with the qualitative research tradition and predominantly uses an inductive approach. The aim is to seek patterns in a set of empirical observations that can help generate hypotheses which could be tested in future studies.

3. Context of the study

Luxembourg, a very small country in Western Europe, borders Germany in its East and Germany borders Switzerland in the South. Table 2 presents the sizes, populations as well as economic and social key indicators of each country. The countries saw their first cases of COVID-19 in three different months but all went into lockdown in March 2020. Fig. 1 draws on data from the European Centre for Disease and Prevention and Control (2020) and illustrates the evolution of the COVID-19 cases in the three countries from 1/03/2020 to 14/07/2020. The latter date corresponds to the end of the data collection where the curbs had flattened in the three countries.

Schools in the three countries closed in mid-March and opened in May 2020. In Luxembourg and Germany, schools reopened in phases, depending on the types of schools and Year groups. Students in higher classes who had to prepare for exams returned first, followed by younger secondary school children and, later, children in primary school (Brandon et al., 2020; Huber et al., 2020; Huiart et al., 2020). For example, in Luxembourg, students taking exams returned on 4th May 2020, other secondary school children on the 11th and primary school children

Table 2
Key data on the countries.

	Luxembourg	Germany	Switzerland
Population (2020)[1]	626,108	83,166,711	8,606,033
Area (km^2)	2,586	357,376	41,285
States	Unitary	16 federal states	26 cantons
GDP per capita (2019) (US$)[2]	114,705	46,445	81,994
Gini coefficient (2017)[2]	33	31.9	32.7
Inequality adj. HDI[3]	0.83	0.87	0.89
First COVID case in 2020	March, 5	January, 27	February, 25
School closure (wave 1) in 2020	Mid-March	Mid-March	Mid-March
School re-opening in 2020 (wave 1)	May	May	May

[1] https://eacea.ec.europa.eu.
[2] https://data.worldbank.org.
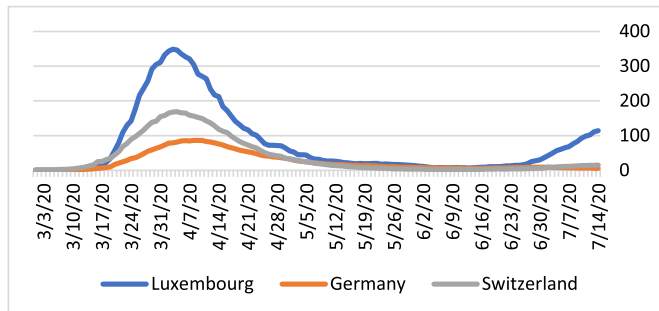[3] http://hdr.undp.org/en/countries/profiles/.

Fig. 1. Total number of COVID-19 positive cases per 100,000 in Luxembourg, Germany and Switzerland.
Source: European Centre for Disease and Control (2020).

on the 25th. Children attended school on alternating weeks to reduce the number of students in classes. In Rhineland-Palatinate, Saarland and Baden-Wuerttemberg, where the questionnaire had been mainly disseminated, secondary schools reopened at the end of April 2020. In Rhineland-Palatinate and Saarland, children in Year 4 returned on 4th May followed later by children in Years 1–3. In Baden-Wuerttemberg, the Year 4 children returned on 18th May, followed weeks later by their older peers. In the German-speaking canton Bern in Switzerland, where the questionnaire had been mainly disseminated, primary and secondary schools closed on 16th March and reopened on 11th May. Like the schools in Germany and Luxembourg, class sizes were reduced to guarantee physical and social distancing. Physical distance measures (e.g. desks apart), social distancing and strict health regulations (e.g. sanitizing stations) were in place. While the school systems in these three countries have many similarities and differences, one important difference needs to be mentioned. In Luxembourg and Switzerland, children attend primary schools for six years starting at the age of six. By contrast, children in the German federal states Rhineland-Palatinate, Saarland and Baden-Wuerttemberg leave primary school at the end of Year 4 to attend secondary at the age of 10.

4. Methodology

4.1. Sample and procedure

The data presented in this paper are part of the larger mixed-method research project COVID-Kids I which used interviews and an online questionnaire to investigate the well-being and stay-at-home experiences of children aged 6 to 16 during the first wave of the COVID-19 pandemic. The project received ethical approval by the University of Luxembourg Ethics Review Panel (20-033A-C-COVID-KIDS) and complies with the European Union's General Data Protection Regulation (GDPR).

The data presented in this paper stem from the online questionnaire Kirsch et al. (2020a) available in Luxembourgish, German, French, En-

glish and Portuguese (European and Brazilian). The unrestricted and anonymous survey was online from the 6th May until the 14th July 2020 and used non-probability sampling. Dissemination efforts focused on Luxembourg, Germany (federal states of Saarland, Baden-Wuerttemberg and North Rhine-Westphalia), Switzerland (Canton Bern) and Brazil, and made use of traditional print, websites, social media, broadcast media, and professional groups. Once children and parents had given informed consent, they were instructed that children should complete the questionnaire on their own in the language of their choice, but that they could seek assistance from parents if needed.

The present paper focuses on the experiences of distant education of the participants in Luxembourg, Germany and Switzerland. Inclusion criteria for the present analysis were age (6–16 years) and country of residence (Luxembourg, Germany, Switzerland). Of the 1773 participants who fit these criteria, responses from 14 participants (0.01 %) were excluded because over 50% of values were missing on the entire questionnaire (excluding the final two open-ended questions). Two further participants (0.001 %) were excluded because questionnaire completion times were too fast (below 7 min). Finally, six children (0.003 %) were excluded due to a mismatch of age and school level: four children aged between 15 and 16 indicated attending primary school and two aged between 6 and 7 attending secondary school. The final sample consisted of 1751 children from Luxembourg ($n = 771$), Germany ($n = 781$) and Switzerland ($n = 259$). From the dataset used for the present analysis, 2.6 % of data were missing. Socioeconomic status (SES) was established based on the occupational status of the caretakers. The latter was converted into the International Socio-Economic Index of Occupational Status (ISEI-08). The ISEI-08 was categorised into three groups, low, middle, high with low having HISEI[1] scores between 1–37, middle 38–63 and high 64–89. Table 3 provides an overview of the sample.

The mean chronological age for participants in Germany and Luxembourg was similar (10 years and 6 months and 10 years and 8 months, respectively). Children in Switzerland were slightly older, 12 years; 1 month. As expected, on average, the children in secondary school in Germany were younger (13; 2) than those in Luxembourg (14; 2) and Switzerland (14; 4). In all three countries, slightly more girls than boys participated. A balanced number of primary and secondary students participated in Germany and Switzerland but in Luxembourg, primary school students were slightly overrepresented. Participants in all three countries fell predominantly in the high SES category: 77% in Luxembourg, 86% in Germany and 73% in Switzerland. The majority of the students reported having internet and access to a computer or tablet at home. Finally, the majority of participants indicated that they were good or very good students and that doing well at school was important or very important.

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[1] HISEI corresponds to the higher ISEI score of either caretaker or to the only available caretaker's ISEI score.

Table 3
Participant characteristics according to Country.

Participant characteristics	Luxembourg (*n* = 711)	Germany (*n* = 781)	Switzerland (*n* = 259)
Age (years; months)	10;6	10;8	12;1
Gender (girls)	401 (57%)	415 (54%)	131 (52%)
Primary school	477 (67%)	391 (50%)	126 (49%)
Secondary school	234 (33%)	390 (50%)	133 (51%)
SES			
- High (ISEI 11-37)	458 (77%)	578 (86%)	165 (73%)
- Middle (ISEI 38-63)	92 (16%)	63 (9%)	39 (17%)
- Low (ISEI 64-89)	44 (7%)	34 (5%)	22 (10%)
Students			
– having internet at home	647 (91%)	680 (87%)	236 (91%)
– having access to a computer or tablet at home	670 (94%)	718 (92%)	243 (94%)
– owning a computer or a tablet	426 (60%)	318 (41%)	129 (50%)
– reporting being good or very good students			
Primary school children	286 (60%)	212 (55%)	71 (56%)
Secondary school children	106 (45%)	182 (47%)	53 (40%)
– reporting it was important or very important to do well in school			
Primary school children	308 (65%)	197 (51%)	76 (60%)
Secondary school children	152 (65%)	237 (61%)	89 (67%)

4.2. Instrument and analysis

For the purpose of this article, 22 of the 68 questions of the questionnaire were analysed. To investigate the primary and secondary school children's experiences of home-schooling, the following questions were analyzed: the type of provision during distance education (e.g. emails, online platform); the type of tasks (e.g. reading, writing); contact time with teachers; the support received at home (e.g. from parents, siblings); the need to use electronic devices, and the ability to use electronic devices. Children were also asked to rate on a 4-point Likert-type scale ranging from "almost never" (1) to "very often" (4) whether their work was understandable, useful, interesting, too much or too difficult, and to add the time spent on schoolwork in hours. Descriptive statistics are used in the analysis. In order to analyze school satisfaction, children were asked to rate school satisfaction before and during the pandemic on a 4-point scale, ranging from "very dissatisfied" (1) to "very satisfied" (4). The two final questions consisted of two open-ended questions: "What is the worst thing for you during the time of the corona virus? What is the nicest thing for you during the time of the corona virus?" Approximately 90% of participants completed these two questions. Of these, 12% of the respondents from Luxemburg, 15% from Germany and 16% from Switzerland explicitly mentioned school in the first question and 9%, 13% and 16%, respectively, in the second one.

The answers to the open-ended questions were analyzed with content analysis (Weber, 1990). Two trained coders initially used the following open codes to analyse the data related to school: "no school" (specific comments about the absence of school); "school" (unspecific comments); "schoolwork" (e.g. type, amount, volume); "support" (of various persons); "achievement" (e.g. results, fears of falling behind); "learning & teaching" (e.g. organisation, feedback); "technology" (e.g. online platforms); "trips & celebrations"; "school in the media"; "school different" (e.g. restrictions), and "school future". In a second step, codes were regrouped thematically and refined. The categories "no school" and "school (general)" were kept while "learning" came to include achievement, organisation, and schoolwork. "Teaching" comprised support of teachers and parents, feedback and assessment. The remaining codes (e.g. technology, trips, school) were more rarely assigned and were classified as "other". The present paper only reports on the categories "no school", "school", "learning" and "teaching". To establish inter-rater reliability 41% of the answers were recoded by a third trained coder. Results indicate acceptable inter-rater reliability for the coding process (Cohen's κ = .85; p < .001).

5. Results

The following sections provide insights into, firstly, the education provision and assistance of teachers and parents, secondly, children's schoolwork and learning time and, finally, their school satisfaction. Each time, the descriptive data will be presented from the closed questions followed by the findings from the two open-ended questions.

5.1. Distance education

Teachers in primary and secondary schools in Luxembourg, Germany and Switzerland had put in place distance education comprising of work sent home or over emails and platforms, and online lessons. Table 4 presents the raw frequencies and percentages of the provision, the type of schoolwork, the support and the use of electronic devices.

In comparison to the children in secondary school, those in primary in all three countries received their schoolwork frequently via email and postal mail. Online platforms were the most used means to provide children with schoolwork in all countries and for all school levels, except for the primary school children in Germany where only 25% received schoolwork in this manner.

In relation to schoolwork, tasks that involved writing were the most frequent for each school level in all three countries with percentages being over 90%. Reading was the second most frequent type in primary schools with a percentage over 70%; watching online videos the third most frequent (over 50%). Reading was also the second most frequent activity followed by watching videos of the secondary children in Luxembourg and Germany. Activities where children needed to look up information or produce something were rarer in all countries, both for children in primary school (34% in Luxembourg, 11% Germany, 44% Switzerland) and secondary (45%, 36%, 69%, respectively).

Contact time per week with teachers appears to differ among countries and school level. The overall tendency suggests that secondary school children had more frequent contact with their teachers than primary school children. In Luxembourg and Switzerland, 18% of primary school children and in Germany even 55% had hardly ever contact with their teacher. Forty-one percent of primary school students in Luxembourg reported having at least three or four times contact with their teacher per week, a number that decreased to 27% for Switzerland, and to 8% for Germany. In secondary schools 77% of the participants in Luxembourg, 41% in Germany and 55% in Switzerland reported having had contact with their teachers daily or three or four times a week. While 23% of the secondary students in Germany reported having hardly any

Table 4

Raw frequencies and percentages (n, %) of different characteristics of schoolwork during the pandemic by country and school level.

Variables	Luxembourg		Germany		Switzerland	
	Primary (n = 477)	Secondary (n = 234)	Primary (n = 391)	Secondary (n = 390)	Primary (n = 126)	Secondary (n = 133)
Provision of Schoolwork						
Post	207 (43%)	13 (6%)	182 (47%)	16 (4%)	60 (48%)	12 (9%)
Email	213 (45%)	114 (49%)	211 (54%)	191 (49%)	45 (36%)	58 (44%)
Online Platform	313 (66%)	229 (98%)	99 (25%)	346 (89%)	71 (56%)	125 (94%)
Online learning and photocophies	119 (25%)	39 (17%)	62 (16%)	50 (13%)	30 (24%)	15 (11%)
Type of Schoolwork						
Writing	428 (90%)	218 (93%)	372 (95%)	369 (95%)	118 (94%)	129 (97%)
Reading	366 (78%)	185 (79%)	277 (71%)	300 (77%)	100 (79%)	99 (74%)
Watching explanations	242 (51%)	173 (74%)	194 (50%)	302 (77%)	78 (62%)	105 (79%)
Looking for information	197 (41%)	171 (73%)	87 (22%)	226 (58%)	47 (37%)	84 (63%)
Making videos	164 (34%)	106 (45%)	44 (11%)	139 (36%)	55 (44%)	80 (60%)
Contact time with teacher						
Hardly ever	86 (18%)	10 (4%)	213 (55%)	89 (23%)	22 (18%)	10 (8%)
1-2 times per week	189 (40%)	44 (19%)	138 (36%)	135 (35%)	67 (54%)	50 (38%)
3-4 times per week	85 (18%)	86 (37%)	9 (2%)	100 (26%)	17 (14%)	31 (24%)
Daily	109 (23%)	92 (40%)	25 (6%)	57 (15%)	19 (15%)	41 (31%)
People who provided help with schoolwork before the pandemic						
Parent (yes)	414 (87%)	119 (51%)	283 (72%)	217 (56%)	84 (67%)	65 (49%)
Sibling (yes)	45 (9%)	34 (15%)	34 (9%)	50 (13%)	20 (16%)	24 (18%)
Other	80 (17%)	14 (6%)	97 (25%)	38 (10%)	7 (6%)	12 (9%)
No need help	83 (17%)	121 (52%)	96 (25%)	194 (50%)	55 (44%)	77 (58%)
No one can help	2 (0%)	24 (10%)	2 (1 %)	19 (5%)	3 (2%)	11 (8%)
People who provided help with schoolwork during the pandemic						
Parent (yes)	452 (95%)	129 (55%)	369 (94%)	255 (65%)	102 (81%)	69 (52%)
Sibling (yes)	57 (12%)	34 (15%)	55 (14%)	59 (15%)	21 (17%)	24 (18%)
Other	21 (4%)	22 (9%)	34 (9%)	50 (15%)	20 (16%)	21 (16%)
Help nobody	30 (6%)	108 (46%)	29 (7%)	146 (37%)	20 (16%)	55 (41%)
Other	6 (1%)	9 (4%)	14 (4%)	18 (5%)	9 (7%)	5 (4%)
Extent to which school is being missed						
Not at all	39 (8%)	41 (18%)	38 (10%)	60 (16%)	14 (11%)	33 (25%)
A bit	114 (24%)	95 (41%)	96 (25%)	136 (35%)	46 (37%)	50 (38%)
A lot	167 (36%)	63 (27%)	115 (30%)	109 (28%)	31 (25%)	35 (27%)
Very much	151 (32%)	32 (14%)	139 (36%)	79 (21%)	32 (26%)	14 (11%)
Use of a tablet or computer for school						
Always	172 (36%)	206 (89%)	27 (7%)	268 (69%)	41 (33%)	108 (82%)
Sometimes	204 (43%)	22 (9%)	162 (42%)	109 (28%)	61 (49%)	23 (17%)
Never	100 (21%)	4 (2%)	197 (51%)	11 (3%)	23 (18%)	1 (1%)

contact with their teachers, this percentage was lower in Luxembourg (4%) and Switzerland (8%). At the level of parental support with schoolwork, the frequencies before and during the pandemic reveal that children in all three countries and at all school levels received more frequent support from parents and siblings during the pandemic than before. This seemed to be particularly the case for primary school children.

The majority of primary school children missed school "a lot" or "very much". This was the case for 68% of children in Luxembourg, 66% in Germany and 51% in Switzerland. The percentage of secondary school children missing school was lower (41%, 49%, 38%, respectively).

With regards to the frequency of use of a tablet or a computer for schoolwork during the pandemic, the most frequent answer for primary children was "sometimes" (43% in Luxembourg, 42% in Germany, 49% in Switzerland) but the large majority of the secondary school students reported to "always" use these electronic devices for schoolwork (89%; 69%; 82%, respectively). The ways in which they were used (by the children who reported using them), and the children's perceived ability to use technology for schoolwork during the pandemic, are reported in Table 5. Results show that electronic devices were most often used to upload materials and that the participating children were digitally literate. More than 80% of the primary school and 94% of the secondary school children indicated coping "well" or "very well" with the technology.

The qualitative data from the two open-ended questions categorized under "teaching" provide further insights into children's experiences. Altogether, 46 children identified the support from teachers or parents during the pandemic as "the worst" or "the nicest thing". Four children

in Luxembourg and 11 in Germany (none in Switzerland) mentioned teachers in relation to the worst thing. Except a few, they bemoaned that teachers did not give them any feedback which they found demotivating. Here is one example of an answer:

> "My teachers don't even give me feedback when I completed their tasks, which demotivates me a lot. Sometimes they don't even tell me what grade I got, I often have to ask them to tell me that. I know, that they have a lot to do as well, but it still makes me feel ignored and not listened to." (Germany, girl, 15)

Other children reported that teachers did not communicate well or were not present enough. The latter thought is expressed in the following quote. "The teacher does not mark my work or answer my questions." (Luxembourg, boy, 9). As for the level of support of the parents, about the same small number of children (four) spoke negatively ("the worst thing") or positively ("the nicest thing") of their parents' assistance. Some found parents to explain well, others expressed the opposite view. When children commented positively on teaching, they almost always referred to the absence of tests which reduced pressure.

> "My mother is always with me and explains school well." (Luxembourg, girl, 6)

> "It is nice to get up and know we do not have any stress because of tests." (Switzerland, girl, 13)

Table 5

Raw frequencies and percentages (*n*, %) of use of electronic devices for distant education during the pandemic by country and school level.

Variables	Luxembourg		Germany		Switzerland	
	Primary (*n* = 376)	Secondary (*n* = 228)	Primary (*n* = 189)	Secondary (*n* = 377)	Primary (*n* = 102)	Secondary (*n* = 131)
Type of tasks with tablet or computer						
Writing	205 (55%)	195 (86%)	67 (35%)	231 (61%)	58 (57%)	113 (86%)
Reading	236 (63%)	172 (75%)	101 (53%)	247 (66%)	57 (56%)	103 (79%)
Record	137 (36%)	98 (43%)	18 (10%)	81 (22%)	34 (33%)	62 (47%)
Upload	260 (69%)	206 (90%)	104 (55%)	361 (96%)	66 (65%)	120 (92%)
Extent to which children indicate to cope with technology						
Badly	11 (3%)	2 (1%)	5 (3%)	0 (0%)	4 (4%)	0 (0%)
Not well	55 (15%)	10 (4%)	31 (17%)	24 (6%)	13 (13%)	3 (2%)
Well	203 (54%)	74 (33%)	98 (52%)	165 (44%)	51 (51%)	51 (39%)
Very well	106 (28%)	142 (62%)	54 (29%)	187 (50%)	32 (32%)	77 (59%)

Table 6

Raw frequencies and percentages (*n*, %) of perceived characteristics of schoolwork by country and school level.

Variables	Luxembourg		Germany		Switzerland	
	Primary (*n* = 477)	Secondary (*n* = 234)	Primary (*n* = 378)	Secondary (*n* = 382)	Primary (*n* = 125)	Secondary (*n* = 133)
Useful						
Almost never	37 (8%)	38 (16%)	71 (19%)	73 (19%)	13 (10%)	24 (18%)
Sometimes	147 (31%)	108 (47%)	143 (38%)	161 (42%)	50 (40%)	62 (47%)
Often	192 (41%)	69 (30%)	109 (29%)	116 (30%)	53 (42%)	36 (28%)
Very often	92 (20%)	17 (7%)	53 (14%)	31 (8%)	9 (7%)	9 (7%)
Interesting						
Almost never	64 (14%)	56 (24%)	85 (23%)	90 (24%)	13 (11%)	27 (21%)
Sometimes	188 (40%)	118 (51%)	168 (44%)	181 (47%)	53 (43%)	64 (49%)
Often	147 (31%)	52 (22%)	85 (23%)	91 (24%)	45 (36%)	35 (27%)
Very often	70 (15%)	6 (3%)	40 (11%)	20 (5%)	13 (11%)	6 (5%)
Understandable						
Almost never	15 (3%)	15 (7%)	9 (2%)	17 (5%)	5 (4%)	4 (3%)
Sometimes	71 (15%)	45 (19%)	64 (17%)	70 (18%)	23 (18%)	28 (21%)
Often	191 (41%)	130 (56%)	165 (44%)	184 (48%)	45 (36%)	66 (50%)
Very often	192 (41%)	42 (18%)	140 (37%)	111 (29%)	52 (42%)	34 (26%)
Too much						
Almost never	131 (28%)	38 (16%)	141 (37%)	88 (23%)	53 (42%)	48 (36%)
Sometimes	203 (43%)	90 (39%)	133 (35%)	139 (36%)	43 (34%)	40 (30%)
Often	78 (17%)	45 (19%)	73 (19%)	87 (23%)	15 (12%)	25 (19%)
Very often	56 (12%)	59 (25%)	32 (8%)	68 (18%)	14 (11%)	19 (14%)
Too difficult						
Almost never	235 (50%)	86 (37%)	215 (57%)	148 (39%)	66 (53%)	57 (43%)
Sometimes	197 (42%)	108 (47%)	140 (37%)	187 (49%)	49 (39%)	63 (48%)
Often	23 (5%)	29 (13%)	18 (5%)	30 (8%)	7 (6%)	9 (7%)
Very often	12 (3%)	9 (4%)	6 (2%)	17 (5%)	3 (2%)	3 (2%)

Note. Children answered the question how frequently they felt their schoolwork was understandable, useful, interesting, too much and too difficult on 4-point scale (1 = "almost never" to 4 = "very often").

5.2. Engaging with schoolwork at home

Children were asked to rate the level of interest and usefulness, as well as the quantity, difficulty and comprehensibility of their schoolwork during the lockdown. Table 6 presents the descriptive statistics on those variables.

Asked how often students felt their schoolwork to be useful, the majority of the students in each country answered that they found their schoolwork "sometimes" or "often" useful. This was the case for children in primary schools (72% in Luxembourg, 67% in Germany, 82% in Switzerland) as well as in secondary schools (77%, 72% and 75%, respectively). The question whether the schoolwork was perceived as interesting was most frequently answered with "sometimes". This answer was chosen by more than 40% of primary school children and more than 47% of those in secondary schools. A high percentage of secondary school children in Luxembourg (74%), Germany (70%) and Switzerland (71%) agreed that their work was "almost never" or "only sometimes" interesting. With regards to how frequently children perceived their schoolwork as understandable, the two most frequent answers were "often" and "very often" for all countries and school levels.

This also means, however, that almost a fourth of all primary school children rated their work as "almost never "or "only sometimes" understandable (26% in Luxembourg, 23% in Germany, 24% in Switzerland). The percentages of secondary students amounted to 26%, 23% and 24%, respectively.

Asked how frequently their schoolwork was too abundant, the most frequent answer for primary school children in Luxembourg was "sometimes", whereas "almost never" was the most frequent answer for primary school children in Germany and Switzerland. Similarly, "sometimes" was the most frequent answer for secondary children in Luxembourg and Germany while children in Switzerland chose most often "almost never". However, a substantial number of children in both primary and secondary schools assessed their work as "often" or "very often" too much. The percentages for primary schools amounted to 29% (Luxembourg), 27% (Germany) and 23% (Switzerland), and to 44%, 41% and 33%, respectively, for secondary schools. A clearer picture emerged from the question of how frequently children found their work too difficult. For each country and each school level more than 90% of children in primary school and 84% in secondary assessed their work as "almost never" or "sometimes" as too difficult.

Table 7

Time spent on schoolwork during the pandemic (raw frequencies and percentages, *n*, %) by country and school level.

Hours spent on schoolwork	Luxembourg		Germany		Switzerland	
	Primary (*n* = 469)	Secondary (*n* = 232)	Primary (*n* = 385)	Secondary (*n* = 381)	Primary (*n* = 125)	Secondary (*n* = 132)
≤1 h	38 (8%)	11 (5%)	60 (16%)	30 (8%)	23 (19%)	17 (13%)
1 h – < 2 h	58 (12%)	18 (8%)	78 (20%)	32 (9%)	24 (19%)	12 (8%)
2 h – < 3 h	112 (24%)	23 (10%)	138 (36%)	69 (18%)	35 (28%)	10 (8%)
3 h – < 4 h	103 (22%)	49 (22%)	91 (24%)	90 (24%)	26 (21%)	22 (17%)
4 h – < 5 h	107 (23%)	52 (23%)	47 (12%)	86 (23%)	21 (17%)	19 (14%)
5 h – < 6 h	45 (10%)	31 (14%)	10 (3%)	51 (13%)	11 (9%)	23 (18%)
≥ 6 h	33 (7%)	49 (22%)	6 (2%)	45 (12%)	3 (2%)	31 (24%)
Mean (SD)	3.3 (1.53)	4.2 (1.96)	2.5 (1.18)	3.7 (1.93)	2.8 (1.38)	4.2 (2.59)

Children were also asked how many hours per day they spent on schoolwork. Children in Luxembourg indicated spending on average 3.6 h, those in Germany 3.1 h and in Switzerland 3.5 h. Split into school levels, values are higher for secondary school children and amount to 4.2 h in Luxembourg and Switzerland, and 3.7 h in Germany. As can be seen in Table 7, there were notable differences between the children between and within each country. For example, in Luxembourg, 8% of the primary school children indicated spending less than an hour on schoolwork per day; this percentage was 16% in Germany and 19% in Switzerland. At the same time, in Luxembourg, 7% of primary school children reported working more than 6 h.

The analysis of the answers in the two open-ended questionnaires indicated similar topics categorized under "learning". Volume and difficulty were frequently mentioned as negative aspects ("worst thing"). Almost all children who commented (23 in Luxembourg, 11 in Germany, 10 in Switzerland) mentioned the quantity of homework which left them little time to do other things. Some children mentioned that they did not understand the work given.

"The stress combined with the amount of homework." (Luxembourg, boy, 16)

"It's bad when you don't understand an assignment and when the teacher puts you under stress by telling you that you are late with everything." (Switzerland, boy, 13)

"I have the feeling that our teachers don't communicate at all (between each other) and have completely different expectations... some communicate via Zoom others via email... and because there are no real lessons, we get much more work than usual in every subject." (Germany, girl, 14)

Seven children expressed fears that they had learned less, were worried of falling behind or failing the class. They indicated that they had forgotten a language, were unable to concentrate, lacked motivation, could not learn at home and did not do their schoolwork. Volume and working time had also been identified as "the nicest thing" by eight children in Luxembourg and Germany. They wrote that they did less work and worked fewer hours. Almost all children (57) who mentioned learning during the pandemic as the "nicest thing", referred to flexibility. Many enjoyed the fact that they could organize their work autonomously and work independently. Two children concluded that they "did more thinking" (Germany, boy, 14) and "progressed a lot" (Luxembourg, boy, 7).

5.3. School satisfaction

Table 8 reports raw frequencies and percentages alongside means and standard deviation (SD) for each school level per country before and after the pandemic.

A clear pattern of a decrease in school satisfaction from before to during the pandemic emerged for each country and each school level.

The frequency of children of the entire sample who reported to be satisfied or very satisfied with school before the pandemic was 90% (Luxembourg: 88%; Germany: 91%; Switzerland: 93%). During the pandemic the overall frequency decreased to 64% (Luxembourg: 72%; Germany: 56%; Switzerland: 73%). A similar pattern of decrease of school satisfaction is observed within each school level for each country. The total number of children who are dissatisfied or very dissatisfied with school increased from 10% (Luxembourg: 9%; Germany: 12%; Switzerland: 7%) before the pandemic to 35% during the pandemic (Luxembourg: 28%; Germany: 44%; Switzerland: 27%).

This section on school satisfaction concludes with some qualitative data from the open-ended questionnaires. Not going to school or having less school were the most frequent types of comments expressed in words such as "home schooling", "no school", "no real school" or "less school". If children made additional comments, they always related to peers they missed or, in some cases, were glad not to see. Here are two examples, one being "the worst thing", one "the nicest thing":

"Not being allowed to go to school and therefore not seeing friends." (Luxembourg, girl, 12).

"Not having to see the idiots in my class." (Germany, boy, 13)

Other frequent comments relating to school across the three countries were the opportunity to sleep in (152 participants) and the absence of stress (36 children).

6. Discussion

The aim of this paper was to explore children's perspectives of distance education, their learning experiences and school satisfaction during the first wave of the COVID-19 pandemic. This section discusses the results by relating the findings to previous studies carried out with children and/ or adults, and combining the children's perceptions of distant education and engagement in their schoolwork.

6.1. Types and perceptions of schoolwork during distant education

According to the participating children, the teachers sent work by postal mail, mainly to younger children, and made use of emails and online platforms. The reported practices of distant education in Luxembourg, Germany and Switzerland were in line with those reported by the Ministry of Education in Luxembourg (MENJE, 2020) and similar to those reported by children in Germany and Switzerland (Huber et al., 2020; König et al., 2020), and elsewhere (Bergdahl & Nouri, 2020; Green, 2020; Mangiavacchi et al., 2020; PAQ, 2020). While the COVID-Kids questionnaire did not ask about online lessons, the interviews reported in Kirsch et al. (2020b) indicate that live-lessons were rare, which has also been found in other studies (Huber et al., 2020; König et al., 2020).

Distance education during the pandemic requires the frequent use of mobile technology. Like in a study in the UK (Penington, 2020), the pri-

Table 8

Descriptive statistics of satisfaction with school before and during the pandemic by country and school level.

	Luxembourg		Germany		Switzerland	
	Primary ($n = 477$)	Secondary ($n = 234$)	Primary ($n = 378$)	Secondary ($n = 382$)	Primary ($n = 125$)	Secondary ($n = 133$)
School satisfaction before the pandemic						
very dissatisfied	16 (3%)	8 (3%)	11 (3%)	8 (2%)	2 (2%)	4 (3%)
dissatisfied	32 (7%)	29 (12%)	20 (5%)	29 (7%)	4 (3%)	9 (7%)
satisfied	208 (44%)	132 (56%)	183 (47%)	253 (65%)	60 (48%)	90 (70%)
very satisfied	221 (46%)	65 (28%)	177 (45%)	100 (26%)	60 (48%)	30 (23%)
Mean (SD)	2.34 (.74)	2.08 (.73)	2.35 (.70)	2.14 (.64)	2.41 (.64)	2.10 (.64)
School satisfaction during the pandemic						
very dissatisfied	30 (6%)	30 (13%)	46 (12%)	46 (12%)	8 (7%)	7 (5%)
dissatisfied	82 (17%)	58 (25%)	129 (33%)	122 (31%)	28 (23%)	26 (20%)
satisfied	252 (53%)	115 (49%)	173 (45%)	175 (45%)	60 (48%)	63 (47%)
very satisfied	110 (23%)	30 (13%)	41 (11%)	46 (12%)	28 (23%)	37 (28%)
Mean (SD)	1.93 (.81)	1.62 (.87)	1.54 (.84)	1.57 (.85)	1.87 (.84)	1.98 (.83)

Note. Children answered the question how satisfied they felt with school before and during the pandemic on 4-point scale (1 = "very dissatisfied" to 4 = "very satisfied").

mary school children in the present study indicated that they sometimes used their electronic devices for schoolwork whereas the majority of the secondary students reported always using them. This was possible because the participants, who mainly came from families of high socioeconomic status, had access to technology. This finding is in line with a survey completed by teachers and parents in Luxembourg (MENJE, 2020) and the study by Huber et al. (2020). Furthermore, the results of the present study show that these tools were most frequently used for uploading material. Few children were asked to engage in more active and creative tasks such as looking up information or producing a short video. The reported tasks, mainly reading, writing and watching videos, are similar to those reported by studies in the UK (Bayrakdar & Guveli, 2020; Green, 2020). Overall, this finding could suggest a teacher-led approach where children are asked to carry out traditional tasks using new technologies or take on the role of listener or spectator while learning at home (Biesta, 2019; Zimmer et al., 2021). While mobile technologies can increase the learners' interest and motivation (Karsenti & Fievez, 2013; Kukulska-Hulme, 2013), the participants in the present study, particularly those in secondary schools, rated their schoolwork as almost never or only sometimes interesting and useful.

The majority of the students had indicated that school was important or very important to them and one could assume that they were motivated learners. At the same time, more than a third rated the quantity of the schoolwork as often or very often too abundant. If children commented negatively on their work in the open-ended questions, it tended to be related to the quantity. Furthermore, the majority of children in primary school and more than 40% of those in secondary school perceived themselves as good or very good students. Nevertheless, approximately 20% of primary school and a quarter of secondary school children rated their schoolwork as not always understandable. This percentage is comparable to a study in Wales where 27% of children indicated not always understanding their schoolwork (Children's Commissioner for Wales, 2020).

6.2. Opportunities for learning

For learning to take place, children need to be actively engaged, interested and motivated, factors that are interdependent (Järvelä & Renninger, 2014; Nayir, 2017). However, as seen in the previous section, not all children found the school tasks interesting and not all could understand them all the time. Making curricular content accessible is the teachers' responsibility. Teachers help children develop knowledge and skills by explaining, checking comprehension, setting differentiated tasks and assessing their progress (Bonal & González, 2020). There are some indications in the data that not all children had optimal conditions

for learning during the pandemic. Some of the answers in the open-ended questions suggest that teachers did not provide feedback or were not present enough, others that children wished more interactions.

Scholars agree that meaningful interactions and high-quality dialogue are necessary for learning (Martin-Beltrán et al., 2017; Mercer et al., 2019). The data indicates that the majority of participants did not have daily contact with teachers. While there was variation between the three countries, the data seems to suggest a general tendency for the primary school children to see their teacher only once or twice a week or even less as in Germany. Secondary school students seemed to have had more frequent contact with their teachers. According to Cuevas-Parra and Stephani (2020) and Mok et al. (2021), reduced contact time with teachers during the pandemic and the lower quality of interactions can impact children's learning. As for parental assistance, the present study shows that parents tended to support their children, particularly those in primary school. This finding confirms results related to parent assistance from previous studies (MENJE, 2020; Penington, 2020; Petretto, et al., 2020).

The time spent on learning activities is related to academic achievement (Andrew et al., 2020). Findings indicate that the reported average time spent on schoolwork by children in Luxembourg and Switzerland is highly similar whereas the time reported in Germany appears lower. The comparison of times spent on learning of the current study, aligns with reported learning times from studies in Luxembourg (MENJE, 2020) and Germany and Switzerland (Huber et al., 2020). Furthermore, the children in primary schools spent less time on schoolwork than those in secondary, which corroborates findings from Bayrakdar and Guveli (2020), Bonal and González (2020) and Brom et al. (2020). Additionally, as reported in other studies, there was considerable variation in study time between children within in each country (Bonal & González, 2020; Huber et al., 2020; Penington, 2020). It has been argued that these differences might contribute towards raising achievement gaps (Andrew et al., 2020).

The open-ended questions of the present study provide a multifaceted picture of children's experiences, similarly to findings from Huber et al. (2020), Children's Commissioner for Wales (2020) and UNICEF Australia (2020). While some of the participants expressed concerns about their lack of motivation and inability to structure their work, others enjoyed their flexibility and independent learning. While some indicated learning less and were worried about their progression, others felt they had progressed well. It was however notable that overall, children's satisfaction with school dropped from before to during the pandemic in the three countries, similarly to findings by (Andresen et al., 2020) in Germany. The majority of children in primary schools and almost as many secondary school children indicated to miss school a lot or very much.

7. Conclusion

The findings of this study show that teachers in all three high-income countries offered varied types of distance education and that parents assisted their children. Contact time with teachers and the children's time spent on schoolwork varied within and between countries. A number of children often found their schoolwork not understandable and school satisfaction dropped across the three countries.

Further research studies could investigate some of the hypotheses generated from this exploratory, inductive study. Given that one finding indicates the possibility of a teacher-led approach where children took on passive roles, future studies could focus on the pedagogy of distant education. Furthermore, the present study reveals that teachers had little contact time with children. One could hypothesize that this did not only result in children having fewer opportunities to check comprehension and develop knowledge compared to school in normal times, but also impact learning time at home. Future studies could explore the relationship between contact time, learning time at home, and achievements. Furthermore, the findings reveal a complex picture of similarities and differences within and across countries. Future studies could examine cross-country similarities and differences more systematically and compare findings between children of different socioeconomic backgrounds. One clear limitation of this study is its bias towards families with high socioeconomic status, another one that it was conducted in high-income countries. A bias towards more affluent and well-educated families is frequently observed in self-selecting online surveys (Andrew et al., 2020). Future studies with children from lower SES households and developing countries are needed because findings may differ substantially from those presented here.

There are some implications for teachers, teacher educators and policy-makers. Teachers may not have had the time nor the expertise to transform teaching approaches and learn to provide efficient distance education (Ahmady et al., 2020; Bergdahl & Nouri, 2020; Hyseni et al., 2020; Naji, 2020; Shin Wan, 2020). The experiences reported by the children in this study suggest that teachers mainly tried to transform regular school lessons into online formats. However, especially during longer periods of school closures, teachers need to use online tools more creatively and efficiently. Teacher educators should provide targeted courses in both initial teacher education and professional development which help teachers design interactive and student-centered online courses with varied communication channels. Schools and policy-makers should ensure that children have access to teaching materials (including electronic devices to enable online learning), understand the tasks, get regular feedback and have opportunities for meaningful exchanges with teachers and peers.

Despite these limitations, the present study makes an important contribution to the field because it used a mixed-method approach, provided a deeper understanding of children's learning experiences in several countries, and asked children directly. We hope that their voices are being heard and acted upon.

Declaration of Competing Interest

The authors have no real or perceived conflicts of interest to declare.

Acknowledgments

References

Ahmady, S., Shahbazi, S., & Heidarim, M. (2020). Transition to virtual learning during the coronavirus disease - 2019 crisis in Iran: Opportunity or challenge? *Disaster Medicine and Public Health Preparedness*, 1–2 [Internet].PMID: 32375914. 10.1017/dmp.2020.142.

Andresen, S., Lips, A., Möller, R., Rusack, T., Schröer, W., Thomas, S., & Wilmes, J. (2020). Erfahrungen und Perspektiven von jungen Menschen während der Corona-Maßnahmen. *Erste Ergebnisse der bundesweiten Studie Juco* https://dx.doi.org/. 10.18442/120.

Andrew, A., Cattan, S., Costa-Dias, M., Farquharson, C., Kraftman, L., Krutikova, S., et al. (2020). Inequalities in children's experiences of home learning during the COVID-19 lockdown in England. *Fiscal Studies, 41*(3), 653–683.

Bayrakdar, S., & Guveli, A. (2020). Inequalities in home learning and schools' provision of distance teaching during school closure of COVID-19 lockdown in the UK. ISER Working Paper Series, 2020(09). doi:10.1111/1475-5890.12240.

Bergdahl, N., & Nouri, J. (2020). Covid-19 and crisis-prompted distance education in Sweden. *Technology, Knowledge and Learning*. 10.1007/s10758-020-09470-6.

Bergdahl, N., Nouri, J., Fors, U., & Knutsson, O. (2020). Engagement, disengagement and performance when learning with technologies in upper secondary school. *Computers and Education, 149*. 10.1016/j.compedu.2019.103783.

Bhamani, S., Makhdoom, A. Z., Bharuchi, V., & Ali, N. (2020). Home learning in times of COVID: Experiences of parents. *Journal of Education and Educational Development, 7*(1), 9–26. 10.22555/joeed.v7i1.3260.

Biesta, G. (2019). Teaching for the possibility of being taught: World-centred education in an age of learning. *English E-Journal of the Philosophy of Education, 4*, 55–69. https://hdl.handle.net/11439/3591.

Bol, T. (2020). Inequality in homeschooling during the Corona crisis in the Netherlands. First results from the LISS Panel. https://osf.io/preprints/socarxiv/hf32q.

Bonal, X., & González, S. (2020). The impact of lockdown on the learning gap: Family and school divisions in times of crisis. *International Review of Education*. 10.1007/s11159-020-09860-z.

Brandon, G.B., Tordoff, D., Meisner, J., Tolentin, L., Jiang, W., Fuller, S., Green, D., Louden, D., & Ross, J. (2020). Summary of school re-opening models and implementation approaches during the COVID 19 pandemic. Available online at: https://childcarecanada.org/sites/default/files/COVID-19%20Schools%20Summary.pdf.

Brom, C., Lukavský, J., Greger, D., Hannemann, T., Straková, J., & Švaříček, R. (2020). Mandatory home education during the COVID-19 lockdown in the Czech Republic: A rapid survey of 1st–9th graders' parents. *Frontiers in Education, 5*(103). 10.3389/feduc.2020.00103.

Children's Commissioner for Wales. Coronavirus and Me (2020). Available from: https://www.childcomwales.org.uk/coronavirus-ourwork/coronavirus-and-me-results/.

Colao, A., Piscitelli, P., Pulimeno, M., Colazzo, S., Miani, A., & Giannini, S. (2020). Rethinking the role of the school after COVID-19. 5. doi:10.1016/S2468-2667(20)30124-9. PMID: 32464100.

Cuevas-Parra, P. & Stephano, M. (2020). Children's voices in the time of COVID-19. Continued activism in the face of personal challenges. https://reliefweb.int/report/world/children-s-voices-times-covid-19-continued-child-activism-face-personal-challenges.

European Centre for Disease Prevention and Control (ECED). (2020). Download historical data (to 14 December 2020) on the daily number of new reported COVID-19 cases and deaths worldwide. https://www.ecdc.europa.eu/en/publications-data/download-todays-data-geographic-distribution-covid-19-cases-worldwide.

Engel de Abreu, P. M., Neumann, S., Wealer, C., Abreu, N., Macedo, E. C., & Kirsch, C. (2021). Subjective well-being of adolescents in Luxembourg, Germany and Brazil during the COVID-19 pandemic. *Journal of Adolescent Health*.

Green, F. (2020). *Schoolwork in lockdown: new evidence on the epidemic of educational poverty*. Centre for Learning and Life Chances in Knowledge Economies and Societies.

Huber, S.G., Günther, P.S., Schneider, N., Helm, C., Schwander, M., Schneider, J.A., & Pruitt, J. (2020). COVID-19- aktuelle Herausforderungen in Schule und Bildung. Erste Befunde des Schul-Barometers in Deutschland, Österreich und der Schweiz. Auswahl einiger Befunde. *Waxmann*. https://www.waxmann.com/waxmann-buecher/?tx_p2waxmann_pi2%5Bbuchnr%5d=4216&tx_p2waxmann_pi2%5baction%5d=show.

Huiart, L., Mazzucato, E., Mombaerts, L., Mossong, J., Rodrigues, B., Schank, F., et al. (2020). L'école face à la COVID-19 au Luxembourg. Rapport d'analyse. Available online at https://men.public.lu/fr/publications/statistiquesetudes/themestransversaux/ecole-covid.html.

Hyseni, D., Zamira & Nagavci, M. (2020). The impact of the COVID-19 pandemic on the education of children with disabilities. doi:10.13140/RG.2.2.17807.41125.

Järvelä, S. & Renninger, K. A. (2014). Designing for learning: Interest, motivation, and engagement, 668–685. Available online at https://www.cambridge.org/core/terms. 10.1017/CBO9781139519526.040.

Karsenti, T., & Fievez, A. (2013). The iPad in education: Uses, benefits, and challenges. Preliminary report of key findings. Available online at www.karsenti.ca/ipad/pdf/iPad_report_Karsenti-Fievez_EN.pdf.

Kaur, N., & Singh Bhatt, M. (2020). The face of education and the faceless teacher post COVID-19. *Journal of Humanities and Social Sciences Research, 2*, 39–48. 10.37534/bp.jhssr.2020.v2.nS.id1030.p39.

Kirsch, C., & Bes Izuel, M. A. (2017). Emergent multilinguals learning languages with the iPad app iTEO: A study in primary schools in Luxembourg. *Language Learning Journal, 47*(2), 204–218. 10.1080/09571736.2016.1258721.

Kirsch, C., Engel de Abreu, P. M. J., & Neumann, S. (2020a). The Luxembourg COVID-Kids questionnaire. Luxembourg: University of Luxembourg. http://hdl.handle.net/10993/45556.

Kirsch, C., Engel de Abreu, P. M. J., Neumann, S., Wealer, C, Brazas, K., & Hauffels, I. (2020b). Subjective well-being and stay-at-home-experiences of children

aged 6-16 during the first wave of the COVID-19 pandemic in Luxembourg: A report of the project COVID-Kids. Luxembourg: University of Luxembourg. http://hdl.handle.net/10993/45450.

König, J., Jäger-Biela, D. J., & Glutsch, N. (2020). Adapting to online teaching during COVID-19 school closure: Teacher education and teacher competence effects among early career teachers in Germany. *European Journal of Teacher Education, 43*(4), 608–622. 10.1080/02619768.2020.180965.

Kukulska-Hulme, A. (2013). *Re-skilling language learners for a mobile world*. Monterey, CA: The International Research Foundation for English Language Education Available online at: http://www.tirfonline.org/english-in-the-workforce/mobile-assisted-language-learning .

Loades, M. E., Chatburn, E., Higson-Sweeney, N., Reynolds, S., Shafran, R., Brigden, A., Linney, C., McManus, M., Borwick, C., & Crawley, E. (2020). Rapid Systematic Review: The impact of social isolation and loneliness on the mental health of children and adolescents in the context of COVID-19. *Journal of the American Academy of Child and Adolescent Psychiatry*. 10.1016/j.jaac.2020.05.009.

Mangiavacchi, L., Piccoli, L., & Pieroni, L. (2020). Fathers Matter: Intra-household responsibilities and children's wellbeing during the COVID-19 lockdown in Italy July 2020. IZA DP No. 13519. Institute of Labor Economics.

Marchant, E., Todd, C., James, M., Crick, T., Dwyer, R., & Brophy, S. (2020). Primary school staff reflections on school closures due to COVID-19 and recommendations for the future: A national qualitative survey. doi:10.1101/2020.11.06.20227108.

Martin-Beltrán, M., Tigert, J. M., Peercy, M. M., & Silverman, R. D. (2017). Using digital texts vs. paper texts to read together: Insights into engagement and mediation of literacy practices among linguistically diverse students. *International Journal of Educational Research, 82*, 135–146. 10.1016/j.ijer.2017.01.009.

MENJE. (2020). Communiqué de presse: L'apprentissage à distance, bien vécu par la majorité des enseignants et des parents. https://gouvernement.lu/dam-assets/documents/actualites/2020/04-avril/com-sondage-SCRIPT.pdf.

Mercer, N., Hennessy, S., & Warwick, P. (2019). Dialogue, thinking together and digital technology in the classroom: Some educational implications of a continuing line of inquiry. *International Journal of Educational Research, 97*, 187–199.

Mok, K. H., Xiong, W., Ke, G., & Cheung, J. (2021). Impact of COVID-19 pandemic on international higher education and student mobility: Student perspectives from mainland China and Hong Kong. *International Journal of Educational Research, 105*(3). 10.1016/j.ijer.2020.101718.

Naji, A. (2020). *The repercussions of Covid-19 on the field of education*. Cambridge Open Engage. 10.37870/naji.1.2020.

Nayir, F. (2017). The relationship between student motivation and class engagement levels. *Eurasian Journal of Educational Research, 17*, 59–78. 10.14689/ejer.2017.71.4.

PAQ. (2020). PAQ Research. Available online at: https://www.paqresearch.cz/post/zivot-behem-pandemie-ekonomicke-dopady-a-distancni-vzdelavani, 17-24. 10.1007/s11298-020-7933-9.

Penington, E. (2020). The numbers behind homeschooling during Lockdown. https://www.childrenscommissioner.gov.uk/2020/06/11/the-numbers-behind-homeschooling-during-lockdown/.

Petretto, D. R., Masala, I., & Masala, C. (2020). School closure and children in the outbreak of COVID-19. *Clinical Practice & Epidemiology in Mental Health, 16*, 189–191. 10.2174/1745017902016010189.

Sharp, C., Nelson, J., Lucas, M., Julius, J., McCrone, T., and Sims, D. (2020). The challenges facing schools and pupils in September 2020. Available online at https://www.nfer.ac.uk/.

Shin Wan, Y. (2020). *Education during COVID 19*. Institute for Democracy and Economic Affairs https://www.researchgate.net/publication/340860261.

UNESCO (2020a). Education: From disruption to recovery. https://en.unesco.org/covid19/educationresponse.

UNESCO (2020b). Adverse consequences of school closures. https://en.unesco.org/covid19/educationresponse/consequences.

UNICEF Australia. (2020). Living in limbo. Fact sheet. Available online at: https://www.unicef.org.au/our-work/unicef-in-emergencies/coronavirus-covid-19/living-in-limbo.

Viner, R., Bonell, C., Drake, L., Jourdan, D., Davies, N., Balltag, V., Jerrim, J., Proimos, J., & Darzi, A. (2020). Reopening schools during the COVID-19 pandemic: Governments must balance the uncertainty and risks of reopening schools against the clear harms associated with prolonged closure. *Archives of Disease in Childhood* archdischild-2020-319963.10.1136/archdischild-2020-319963.

Viner, R., Russel, S., Saulle, R. et al. (2021). Impacts of school closures on physical and mental health of children and young people: A systematic review. medRxiv preprint. doi:10.1101/2021.02.10.21251526.

Weber, R. P. (1990). *Basic content analysis*. Beverly Hills, CA: SAGE.

Zimmer, W. K., McTigue, E. M., & Matsuda, N. (2021). Development and validation of the teachers' digital learning identity survey. *International Journal of Educational Research, 105*, Article 101717. 10.1016/j.ijer.2020.101717.